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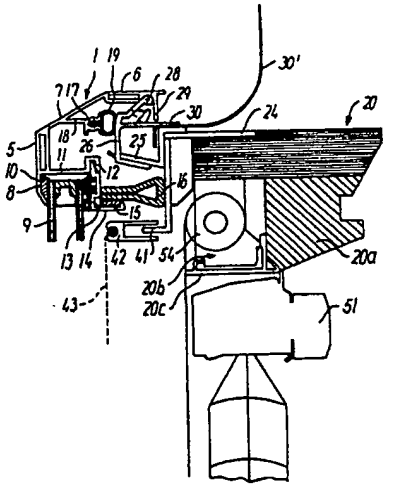
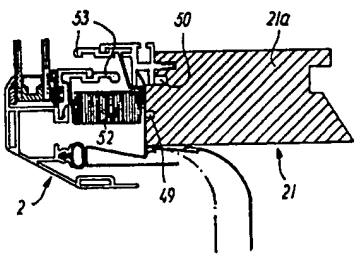
(54) Title: A WINDOW WITH A FRAME OF EXTRUDED PROFILE MEMBERS

(57) Abstract

In a window with a frame of extruded profile members a thermo pane is supported on the inside by a glazing bead connected with the frame profile member. The main frame mainly consists of wood profiles with weather-resisting coverings. A hinge pivot at the top of the window is formed by an edge portion (28) of an extruded profile member (27) connected to the main frame (20) and a hinge blade is formed by a hook-shaped wall portion (6) of the opposite frame profile member (1). To ensure engagement of said hinge pivot and hinge blade in the closed position of the window engaging means at one of the other sides of the window may comprise a sliding block (31) arranged displaceably in a track in a frame member between a fixed window position opposite a retaining device anchored in the main frame and an openable window position for connection to a motion transfer member guided in a recess in the main frame.





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A Window With A Frame of Extruded Profile Members.

The invention relates to a window, comprising a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings.

The invention mainly but not exclusively has as object windows designed as top-hinged roof windows to be installed in inclined roofs.

Windows of said type must, when openable, normally be provided with separate, robust hinge elements and motion transfer connections between the frame and the main frame; this partly causes an increase of the production costs and, partly often mars the appearance of the window.

Also, if it is desired to provide the window with accessories known per se such as a roller blind, a Venetian blind, an insect screen or the like, separate fastening and movement control members for such accessories are required.

In openable windows of this type it is known per se to use motor control for the opening/closing movement and also for said accessories, but this has usually required specially designed frame and main frame structures often with relatively complicated electrical wiring.

The primary object of the invention is to provide a window with a comparatively simple frame and

structure facilitates the mounting process inasmuch as the frame can be hooked on to the main frame structure in a simple way after the latter has been fastened in the roof opening.

Further advantages and details of this window structure appear from claims 2-15.

According to a second aspect of the invention a window of said type in which the frame and main frame are hinged at one side is characterized in that a coupling member is arranged at one of the other sides which can be moved between a position opposite a retaining device anchored in the main frame structure for permanently securing the frame in case of a fixed window and a position in which it can be connected to a motion transfer member which is guided in a recess in the wood profile of the main frame for complete accommodation of the motion transfer member in the closed position of an openable window.

With this design, one and the same window structure can without changes of the frame and main frame profiles be used as a fixed window, partly extended or modernized as manually operated or motor-controlled openable window.

According to a third aspect of the invention a window as mentioned initially is characterized in that extruded profile members are fastened to the side of the main frame wood profiles facing the light admitting area of the window to form tracks for reception and movement control of accessories such as a roller blind, an insect screen and/or a Venetian blind and that one or more of the main frame wood profiles are provided with a recess to accommodate one or more drive motors for said accessories, and that the main frame wood profiles are provided with factory-mounted

wiring underneath the weather-resisting coverings for power supply to said motors.

This embodiment permits a stepwise extension of a relatively inexpensive, simple window structure into a more sophisticated design with various accessories and motor control.

According to a further aspect of the invention a window as mentioned initially, having a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings, the frame profiles being provided with wall portions which form tracks for sealing strips for sealing engagement with parts of the weather-resisting main frame coverings for insulation between these and the frame profiles is characterized in that one of said extruded profile members on the main frame wood profile and one of said wall portions of the frame profiles are arranged for alternative connection to fixing elements of an accordion-folded insect screen, which in a openable window is positioned between the side and bottom portions of the frame and main frame.

In this design a top-hinged openable window will already in its supply condition be ready for mounting of an accordion-folded insect screen which efficiently covers the opening between the frame and the main frame in the open position of the window.

The invention also relates to a window with a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have

first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings, whereas the frame and the main frame are hinged on one side and a motion transfer member is connected between the frame and the main frame at at least one of the sides at right angles hereto.

For the purpose of providing an extremely simple and robust motion transfer member, to an extent as possible arranged as an embedded installation for such an openable window according to this further aspect of the invention the window is characterized in that the motion transfer member is a rack in engagement with a toothed wheel which is accommodated in a recess so as to be retained in the closed position of the window.

As a common embodiment of the invention in its various aspects a top-hinged openable roof window for installation in an inclined roof is described in the following with reference to the drawings, in which

Fig 1 is a vertical, longitudinal sectional view of the window;

Fig 2 is a transverse section at right angles to the window plane;

Fig 3 shows a coupling member according to the invention;

Fig 4 is a cross section of the coupling member shown in fig 3;

Fig 5 shows the connection between the frame and main frame in a fixed window;

Fig 6 shows an opening/closing device according to the invention;

Fig 7 shows a detail of the opening/closing device shown i fig 6; and

Fig 8 shows a main frame bottom portion ready for arrangement of an accessory motor.

In the embodiment shown in the sectional views in Figs 1 and 2 the window according to the invention comprises a frame made of extruded profile members, preferably aluminium, of which Fig 1 shows the top portion 1 and the bottom portion 2, and Fig 2 the two vertical side portions 3 and 4.

The frame profile members 1-4 have the same basic cross section which as shown in Fig 1 can be substantially L-shaped with a first wall portion 5 parallel to the glass plane and an exterior wall portion 6 at right angles hereto connected via an oblique corner portion 7.

The first wall portion 5 comprises a flange part 8 as a supporting member for an edge portion of at the outside of a thermo pane 9 at sealing means 10.

A flange portion 11 projecting inwards at right angles to the wall portion 5 is at its free end provided with a track 12 for accommodation of a glazing bead 13, which supports the edge portion of the thermo pane 9 at the opposite side.

The glazing bead 13 is substantially L-shaped with a flange portion 14 projecting inwards at right angles to the glass plane forming a track 15 for retaining a comparatively wide sealing strip 16 for sealing between the frame and the main frame 1 in the closed position of the window.

In the drawing this sealing strip 16 is only shown in connection with the frame top portion 1 in

Fig 1 and the left vertical wall portion 3 in Fig 2, but in the embodiments which comprise the sealing strip it is normally arranged in connection with all four frame profile members.

In a track 17 formed by a flange portion 18 inwards projecting from the oblique corner portion 7 a sealing strip 19 is accommodated in a corresponding manner defining the outer sealing plane of the window.

The main frame portions positioned opposite the frame profile members 1-4 in the window after installation comprise a top portion 20 and two vertical frame portions 22 and 23. The frame portions are mainly made of wood profiles 20a, 21a, 22a and 23a, the exterior surfaces of which are covered by weather-resisting coverings.

The wood profile 20a of the top portion is composed of two members which together form a duct 20b facing the thermo pane 9 which at its bottom is delimited by a metal profile member 20c projecting outwards from the wood profile and can be used to accommodate a roller blind rod 54. The weather-resisting covering here comprises an L-shaped metal profile member 24, which covers the side of the wood profile 20a facing the thermo pane 9 and part of the top side of the profile.

A likewise L-shaped metal profile member 25 is fastened to the profile member 24 and connected with an extruded profile member 26.

According to a first aspect of the invention this profile member 26 is provided with an upwards projecting oblique flange portion 27, of which an edge portion 28 of increased thickness forms a hinge pivot for engagement with flange portion 29 projecting downwards from the exterior wall partion of frame

top portion 1, whereby the exterior wall portion 6 forms a hook-shaped hinge blade.

In this embodiment a hinge member which permits opening and closing of the frame in relation to the main frame by turning around the axis defined by the edge portion 28 is designed as an integral part of the frame and main frame top portions.

The use of separate production cost increasing hinge members is thus avoided and the shown top-hinged embodiment facilitates mounting since the frame can relatively easily be hooked on to the hinge pivot forming edge portion 28 after installation of the main frame.

In the shown embodiment where the window is designed for installation in an inclined roof the profile member 26 can furthermore be provided with a flange portion 30 projecting parallel to the top side of the profile member 25 so that the surrounding, e.g. sheet-shaped sealing material can be wedged in between the flange portion 30 and the profile member 25.

As it most clearly appears from Fig 2, the flange portions 11 and 18 projecting inwards from the frame profile members form a track with a mainly square cross section, which in the vertical frame portions 3 and 4 can be used to accommodate a block shown in figs 3 and 4 which is displaceable in the track and can be retained in random position in same by means of fixing screws arranged in oblique holes 33.

The block 32 serves as a coupling member for connection of the frame either with a locking device permanently fastened to the frame portion in a fixed window or with a motion transfer member connected to

an opening/closing device mounted in the main frame portion.

In a fixed window the coupling member 32 is fastened in the track 31, as shown in Fig 5, at the bottom part of the vertical frame portions and connected to an arm which is fastened to the main frame portion by means of a fitting which may be positioned beneath the weather-resisting covering.

In an openable window the coupling member 32 is fastened in the track 31 in the upper part of the frame portion.

In the embodiment shown in Fig 6 the motion transfer member consists of a curved rack 37 in engagement with an opening/closing device 39 arranged in a recess 38 in the exterior side of the main frame profile. The recess 38 is as shown designed so that it can accommodate the entire length of the curved rack 37 in the closed position of the window.

In the opening/closing device 39 the rack 37, which as shown in Fig 7 is toothed on the concave side, is in engagement with a toothed wheel 40 which via a transmission not shown is run by an electromotor with reversible direction of rotation.

Opposite the toothed wheel 40 the rack is supported by a supporting wheel 41 on its convex side.

In order to allow release of the engagement between the rack 37 and the toothed wheel 40 the toothed wheel is preferably mounted eccentrically, e.g. by an eccentric connection between its axle journal and an operating member that can be turned and which is accessible from the inside of the main frame portion so that when it is turned manually the toothed wheel 40 is released from its engagement with the rack 37, for example to position 40' shown in dot-

ted line, whereby the latter can be completely released from the main frame portion when the window is opened manually.

The special coupling member 32, which permits changing a fixed window into an openable window is not restricted to use in top-hinged windows or in connection with the integral hinge member described above. Nor is it restricted to use together with the described opening/closing device and the motion transfer member designed as a rack.

The same applies to the described embodiment of the opening/closing device and the rack, the use of which is not restricted to top-hinged windows or together with the integral hinge member or the special coupling member.

In the top-hinged window shown, the concave side of the rack 37 can be designed with such a curvature variation, e.g. as shown in Fig 7, with a curvature radius R_2 on a short length of the end of the toothing closest to the coupling member 32 which is considerably smaller than curvature radius R_1 on the remaining length of the rack, whereby an advantage is obtained, i.e. that the rack 37 never projects beyond the inside 122 of the main frame wood profile.

The distance from the hinge outside Fig 6 to the right to the engagement point of the rack 37 at the pivot 35 in the shown embodiment is larger than the distance from said hinge to the engagement point of the rack 37 with the toothed wheel 40. Hereby the advantage is obtained that the window frame after having reached the closing position in continuation of the closing movement is lifted briefly towards the hinged side whereby it is brought in abutment on the main frame, and sealing between the sealing strips 16

and 19 and the main frame portions abutting on same is ensured.

As it appears from Figs 1 and 2 the window can be manufactured so as to be ready for mounting of accessories such as, e.g. a roller blind, an insect screen or a Venetian blind.

The profile member 24 in the main frame top portion can thus be designed with a projecting flange portion 41 for clipping on an edge fastening member 42 at one side of a fixed insect screen 43, and the main frame side portions and bottom portions can be provided with tracks 44 for accommodation of extruded profile members 45 with projecting flange parts 46 for clipping on edge fastening members 47 at the sides and lower edge of such an insect screen.

The window can likewise already when supplied be arranged for motor control of, e.g. a roller blind as shown in Fig 1 where as shown in Fig 8 the wood profile member of main frame bottom portion 21 may be provided with a recess 48 for accommodation of an electrical drive motor which in a manner known per se can operate a roller blind by means of a cord arrangement connected to said bottom portion.

In connection herewith the main frame members may in their supply condition be provided with embedded wiring for which, as shown in Fig 2, grooves 49-50 can be provided in one of the surfaces of the main frame members which subsequently is covered by weather-resisting coverings.

In connection with such wiring a switch member can be provided in one of the main frame side portions for an electrical plug-and-socket connection for the drive motor of the Venetian blind 51, which as shown in Fig 1 can be mounted immediately below the main frame top portion 20.

In addition, the main frame bottom portion 21 as shown in Fig 1 and the right side portion 23 as shown in Fig 2 may be arranged for mounting of an accordion-folded insect screen 52 of a design known per se. Such a screen is fastened both to the main frame and the frame at the two side portions and at the bottom portion so that the openings between the main frame and the frame are completely screened.

The track 15 in the main frame formed by the glazing bead 13, otherwise used for mounting of the sealing strip 16, is used for mounting of the accordion-folded screen 52, as well as the projecting flange portions 46 of the profile members 45 of the frame, alternatively used for mounting of the fixed insect screen 43.

In order to facilitate mounting the accordion-folded insect screen 52 can be provided with fastening members 53, which can be clipped on said flange portions.

PATENT CLAIMS

1. A window comprising a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings, characterized in that a hinge member at the top of the window comprises an edge portion of an extruded profile member forming a hinge pivot firmly connected to the main frame portion at this side and a hook-shaped wall portion of the opposite frame profile member forming a hinge blade, whereas at one of the other sides of the window means are provided to ensure engagement of said hinge pivot and hinge blade forming portions in the closed position of the window.

2. A window as claimed in claim 1, characterized in that the hinge blade forming wall portion of the frame profile member comprises a flange part of the upper exterior side wall of the frame profile member which projects downwards substantially parallel to the glass plane.

3. As window as claimed in claim 1 or 2, characterized in that said engagement ensuring means is provided at at least one of the vertical sides of the window and comprises a member fastened to the frame profile which in the closed position of the window is retained in the wood frame profile.

4. A window as claimed in claim 3, c h a r - a c t e r i z e d in that said member is a sliding block arranged displaceably in a track in the frame profile member, which block can be moved between a position opposite a retaining device anchored in the main frame structure for permanently securing the frame in case of a fixed window and a position in which it can be connected to a motion transfer member which is guided in a recess in the wood profile of the main frame for complete accommodation of the motion transfer member in the closed position of an openable window.

5. A window as claimed in claim 4, c h a r - a c t e r i z e d in that the motion transfer member is designed as a curved rack in engagement with a toothed wheel which is accommodated in said recess so as to be retained against turning in the closed position of the window.

6. A window as claimed in claim 5, c h a r - a c t e r i z e d in that the distance from said toothed wheel to the hinge member is smaller than the distance from the hinge member to the connection point between the sliding block and the motion transfer member.

7. A window as claimed in claim 4, 5 or 6, c h a r a c t e r i z e d in that said rack is toothed on the concave side and designed with such a curvature variation that it does not project beyond the inside of the wood frame profile.

8. A window as claimed in any of the preceding claims, c h a r a c t e r i z e d in that extruded profile members are fastened to the side of the main frame wood profiles facing the light admitting area of the window to form tracks for reception and movement control of accessories such as, e.g. a roller blind, an insect screen or a Venetian blind.

9. A window as claimed in claim 8, c h a r - a c t e r i z e d in that the wood profile member of the main frame bottom is provided with a recess to accommodate at least one drive motor for said accessories.

10. A window as claimed in claims 6 and 9, c h a r a c t e r i z e d in that the main frame wood profiles are provided with factory-mounted wiring underneath the weather-resisting coverings for power supply to said drive motor or motors.

11. A window as claimed in claim 10, c h a r - a c t e r i z e d in that in one of the frame portions said wiring is connected to a factory-mounted switch member for a plug-and-socket connection.

12. A window as claimed in any of the preceding claims, c h a r a c t e r i z e d in that the frame profile members are provided with wall portions forming tracks for sealing strips for sealing engagement on parts of the weather-resisting main frame coverings and for insulation between these and the frame profile members.

13. A window as claimed in claim 12, c h a r - a c t e r i z e d in that one of said wall portions is formed by the glazing bead.

14. A window as claimed in claims 8 and 12, c h a r a c t e r i z e d in that one of said extruded profile members on the main frame wood profiles and one of said wall portions of the frame profiles are arranged for alternative connection to fixing elements of an accordion-folded insect screen, which in an openable window is positioned between the side and bottom portions of the frame and the main frame.

15. A window as claimed in one of the preceding claims and designed as a roof window to be mounted in an inclined roof, c h a r a c t e r i z e d in that

the coverings for weather-resistant connection between the main frame and the surrounding roofing material are retained between the main frame wood profile coverings or between these and the main frame wood profiles.

16. A window comprising a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings, the frame and the main frame being hinged on one side, c h a r a c t e r i z e d in that a coupling member is connected with the frame profile on one of the other sides and can be moved between a position opposite a retaining device anchored in the main frame structure for permanently securing the frame in case of a fixed window and a position in which it can be connected to a motion transfer member guided in a recess in the main frame wood profile for complete accommodation of the motion transfer member in the closed position of an openable window.

17. A window comprising a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are cov-

ered by weather-resisting coverings, c h a r a c t - e r i z e d in that extruded profile members are fastened to the side of the main frame wood profiles facing the light-admitting area of the window and form tracks to receive and control the movement of accessories such as, e.g. a roller blind, an insect screen or a Venetian blind, one or more of the main frame wood profiles being provided with a recess to accommodate one or more drive motors for said accessories, the main frame wood profiles being further provided with factory-mounted wiring underneath the weather-resisting coverings for power supply to said motors.

18. A window with a frame of extruded profiles, c h a r a c t e r i z e d in that said wiring in one of the main frame portions is connected to a factory-mounted switch member for a plug-and-socket connection.

19. A window comprising a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings, the frame profiles being provided with wall portions which form tracks for sealing strips for sealing engagement with parts of the weather-resisting main frame coverings for insulation between these and the frame profiles, c h a r a c t e r i z e d in that one of said extruded profile members on the main frame wood profiles and one of said wall portions of the frame profiles are arranged for alternative connection to fixing elements

of an accordion-folded insect screen, which in an openable window is positioned between the side and bottom portions of the frame and main frame.

20. A window comprising a frame of extruded profile members which at their exterior side surfaces parallel to the glass plane have a first flange portion as a supporting member for an edge portion of a thermo pane on the external side thereof, whereas an opposite edge portion at the inside of the thermo pane is supported by a glazing bead connected with the profile member, and a main frame mainly consisting of wood profiles, the exterior surfaces of which are covered by weather-resisting coverings, the frame and the main frame being hinged on one side, a motion transfer member being connected between the main frame and the frame, c h a r a c t e r i z e d in that the motion transfer member is designed as a curved rack in engagement with a toothed wheel which is accommodated in a recess in the main frame wood profile and can be secured in the closed position of the window.

21. A window as claimed in claim 20, c h a r a c t e r i z e d in that the distance of said toothed wheel from the hinge member is smaller than the distance from the hinge member to the connection point between the motion transfer member and the frame.

22. A window as claimed in claim 20 or 21, c h a r a c t e r i z e d in that said rack is curved and toothed on the concave side and designed with such a curvature variation that it does not project beyond the inside of the main frame wood profile.

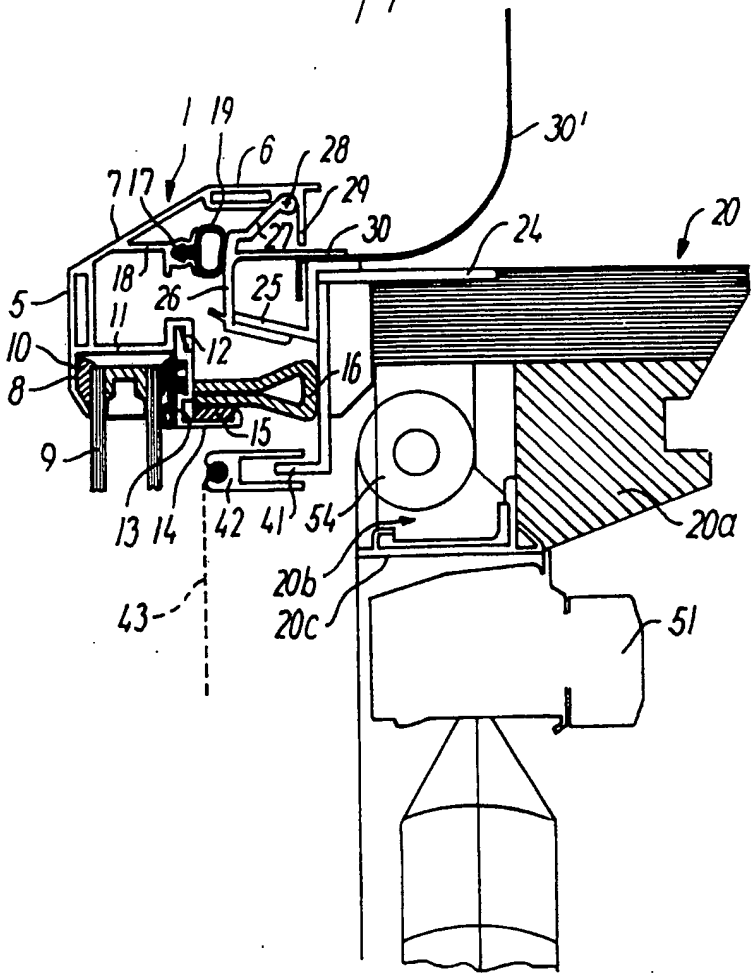
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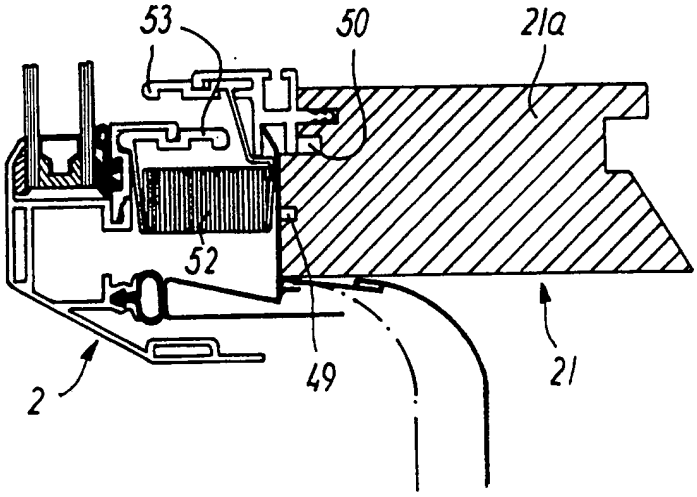
FIG. 1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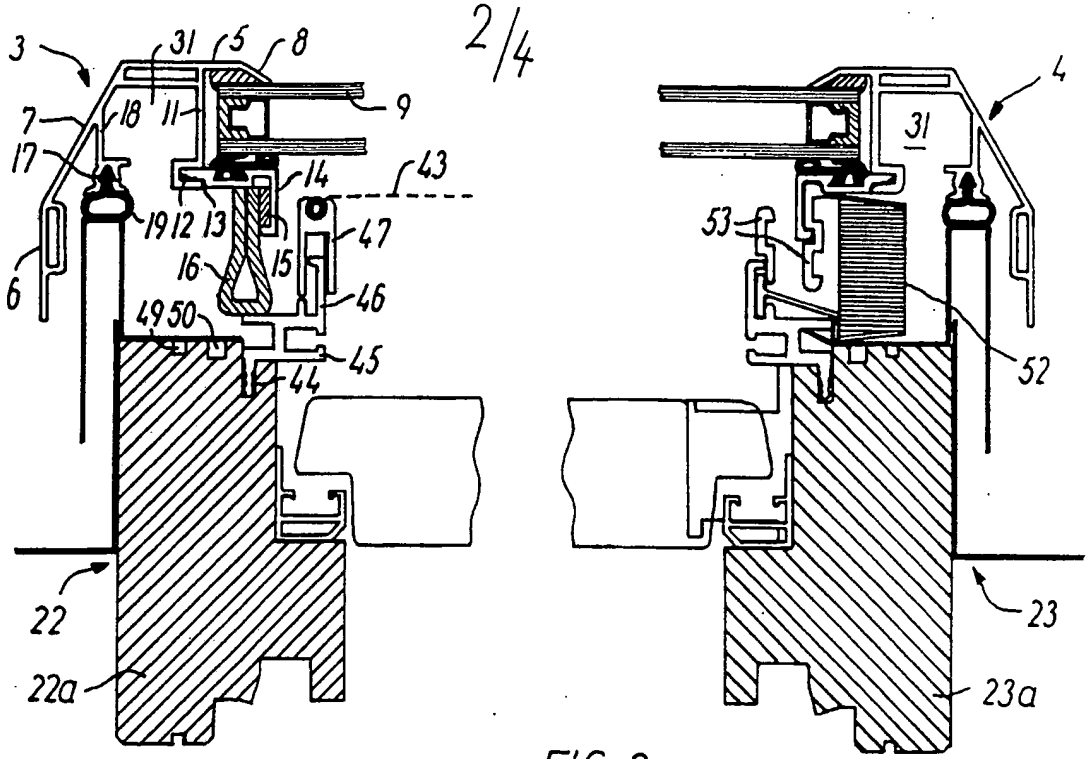


FIG. 2

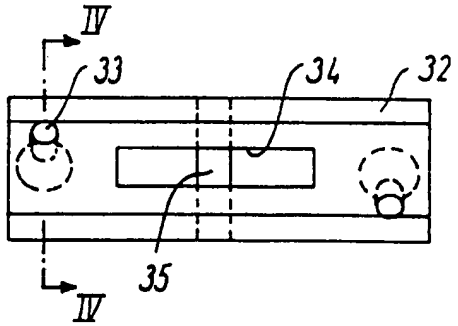


FIG. 3

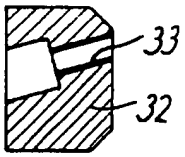


FIG. 4

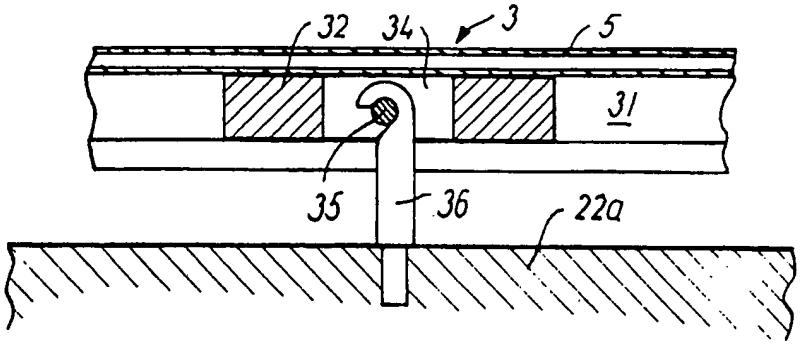


FIG. 5

FIG.6

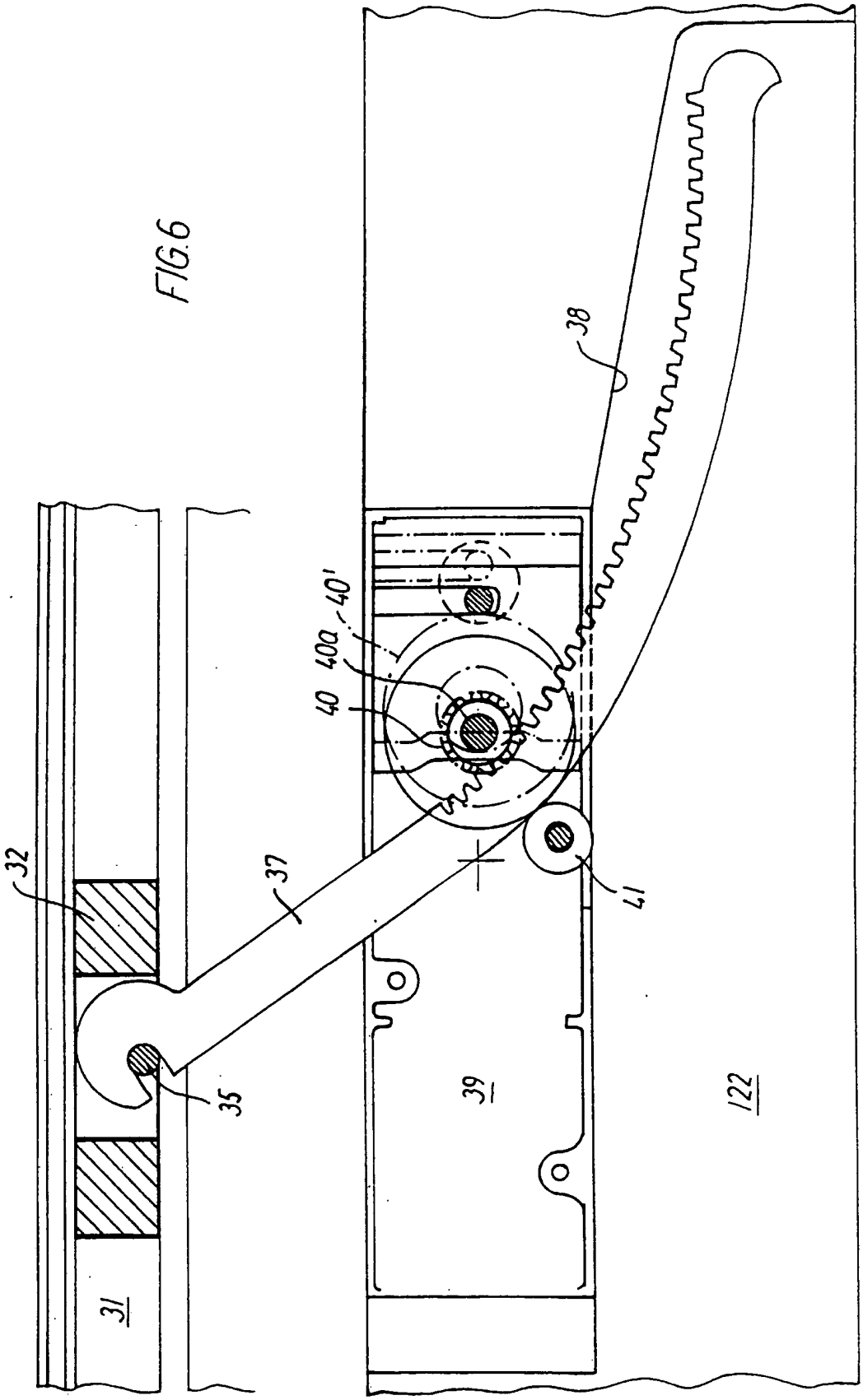


FIG.7

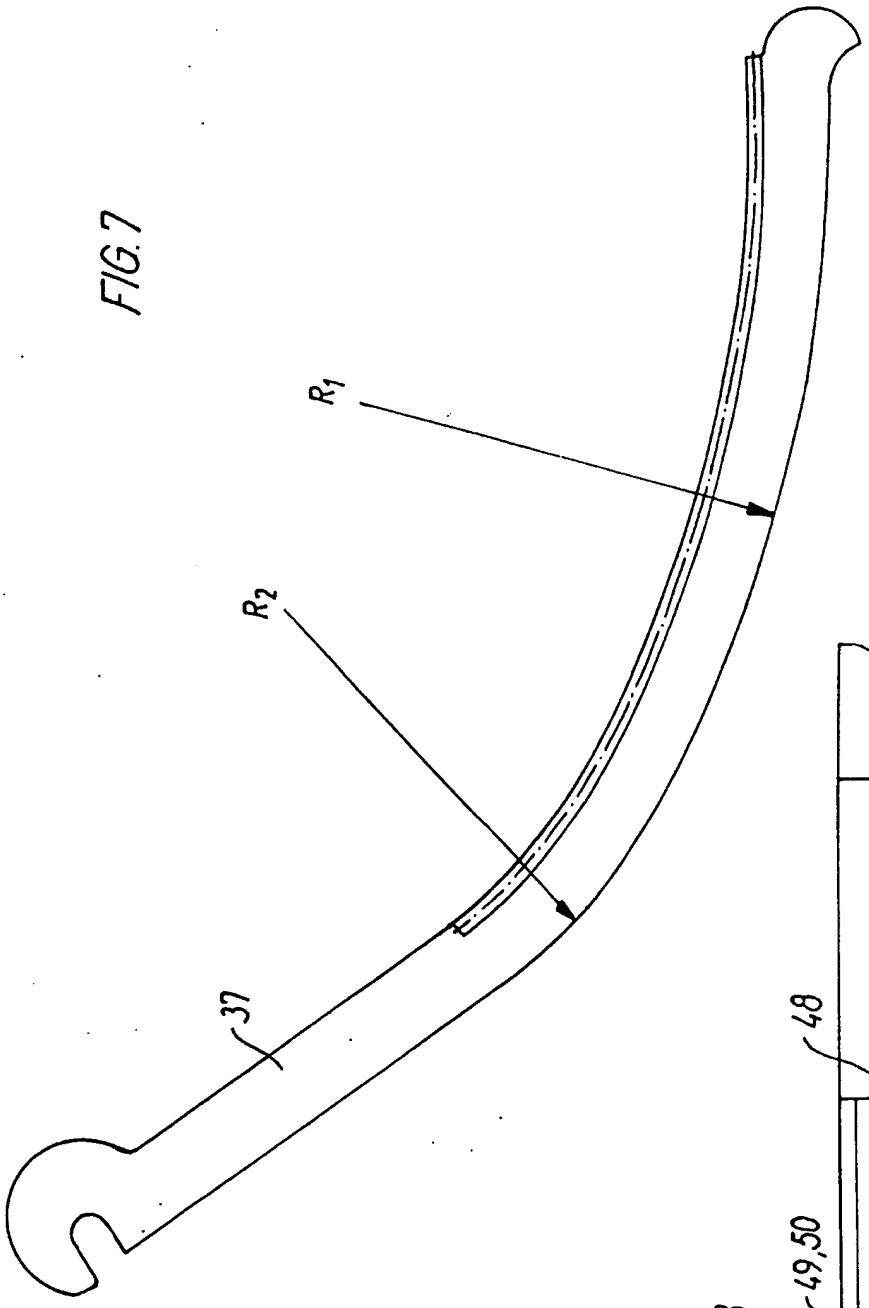
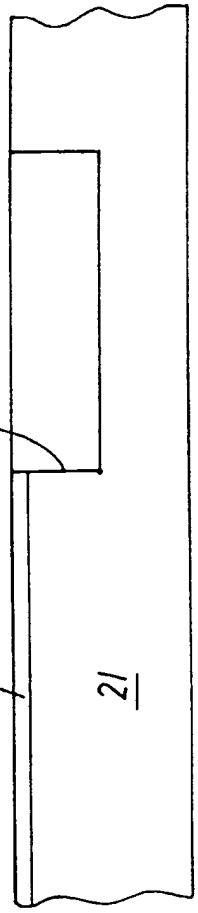


FIG.8



INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 92/00362

A. CLASSIFICATION OF SUBJECT MATTER

IPC5: E06B 3/38, E05C 17/04
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: E06B, E05C, E05F, E05B, E04D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SE, B, 396978 (A. KNAG AS), 19 Sept 1975 (19.09.75), page 3, line 25 - line 32; page 5, line 12 - line 29, figures 1,5	1,2,3,12,13
Y		4-8,16,20-22
	--	
Y	DE, C2, 1708430 (GEZE GMBH), 9 June 1982 (09.06.82), page 3, column 4, line 39 - page 4, column 5, line 30	4-7,16,20-22
	--	
Y	AU, B, 63698/80 (BRUCE ARTHUR MORGAN), 30 April 1981 (30.04.81), figure 2	8,19
	--	

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
1 March 1993	26 -03- 1993
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Thorunn Grenmark Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK 92/00362

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE, A1, 2503519 (BEIJER GMBH), 5 August 1976 (05.08.76), figures 1-2	15
	--	
X	US, A, 1925817 (F.J. PLYM), 5 Sept 1933 (05.09.33), page 2, line 11 - line 92	1,2
	--	

INTERNATIONAL SEARCH REPORT

Information on patent family members

29/01/93

International application No.
PCT/DK 92/00362

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-B- 396978	19/09/75	DE-A- 2511418	25/09/75
		GB-A- 1519461	26/07/78
		SE-A- 7415392	19/09/75
		US-A- 3991519	16/11/76
DE-C2- 1708430	09/06/82	NONE	
AU-B- 63698/80	30/04/81	NONE	
DE-A1- 2503519	05/08/76	NONE	
US-A- 1925817	05/09/33	NONE	